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CLINICS.

CLINICAL LECTURES.

Clinical Lecture on Diphtheria. By EDW. HEADLAM GREENHOW, M. D., Assistant-Physician to the Middlesex Hospital. (Continued from p. 149.)

I must not conceal from you, indeed, that in a very large majority of cases tracheotomy does not succeed in saving life. No sufficient data exist from which to estimate accurately the average success after this operation, either in England or in this metropolis; but, judging from my own observation and from information obtained from others, it has been very small. In France and also in Scotland the average of success after tracheotomy would seem to have been decidedly larger. In the former country, Trousseau, the celebrated Professor of Clinical Medicine at the Hôtel Dieu, has operated in more than 200 cases, of which fully one-fourth recovered; Bretonneau in 30 cases, of which six recovered; Bouchut in 160 cases, of which 45 recovered; and Velpeau in 19 cases, of which he saved 2. In Scotland, Mr. Spence, of Edinburgh, has operated in 54 cases, of which 19 recovered; and Dr. Buchanan, of Glasgow, in 15 cases, of which 5 recovered. It is true that many of the Scotch cases, and doubtless also many of the French ones, were cases of sporadic croup, in which the operation is more likely to be successful than in true diphtheria; but, excluding these, Mr. Spence has had 7 recoveries, out of 18 cases in which he has operated for diphtheria; and Dr. Buchanan 2 out of 8; although in almost all these cases death appears to have been imminent from apnœa at the time the operation was performed. It may prove to be true, as Mr. Spence observes in the paper from which I have taken the statistics of his cases, that such an average of cures will perhaps scarcely be maintained; but the fact remains that in the practice of these two gentlemen 9 out of 26 children have been brought back, as

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it were, from the very brink of the grave by the successful performance of tracheotomy for diphtheria. This amount of success, in my opinion, renders it imperative upon us, not only to recommend the operation in all suitable cases, but even to urge it in such cases at the time which affords the best hope of saving life, taking every precaution to insure those details of management after the operation which contribute most essentially to its chances of success. Here, therefore, arise three practical questions—as to the proper cases for tracheotomy, the proper time for performing the operation, and the proper management after its performance—on each of which I can give you to day merely a few suggestive hints.

With regard to the first question—namely, the proper cases for tracheotomy—you must never lose sight of the fact that tracheotomy is not in itself a curative, but simply a palliative measure; that it is not performed with the view of saving life by arresting the disease, but only with that of preventing the disease from destroying life by its local effects. The proper cases for operation are, consequently, those in which the local effects constitute the only pressing danger, and are so situated that it is possible for tracheotomy to relieve them; that is to say, when the urgent symptoms arise only from the obstruction to respiration, and when that obstruction appears to be situated chiefly in the larynx or trachea. and not below the point where the trachea can be opened. If therefore, on auscultation, we discover the existence of pneumonia or extensive bronchitis, or if we have reason to believe that the exudation already extends in any considerable degree into the bronchial tubes, the operation would be useless and should not be attempted. On the other hand, dulness on percussion, unattended by moist râles, and supposed to proceed from collapse of a portion of the lung, does not preclude the operation; for, as we have seen, this collapse is caused by the very obstruction which the operation is calculated to relieve: but, at the same time, it very greatly diminishes the chances of success, by diminishing the patient's ability to cough up the membranous or mucous obstructions to respiration. The chances are still less in cases complicated by any of the symptoms due to the severity of the constitutional affection; yet, even in such cases, if I found the laryngeal symptoms alone threatening imminent death, I should think it right to give the patient the respite and relief almost certain to be afforded by the operation, though I should not fail to apprise the patient's friends that the presence of such complications rendered the prospect of recovery all but utterly hopeless.

Next as to the proper time for performing the operation. It has been the rule in this country to defer tracheotomy until death from apnœa appeared imminent, and this postponement of the operation has in my judgment been one cause of its general ill-success. I should, therefore, be inclined to lay it down as a rule, that in all favourable cases for tracheotomy, whenever medical treatment has failed to arrest the disease, and the cough and dyspnœa are becoming more and more urgent, and above all, when any lividity from imperfect aëration of the blood makes its appearance, the operation should not be delayed. Whatever may be the risks which, in cases complicated with serious constitutional symptoms, render tracheotomy advisable only as a last resort against impending suffocation, it is in my opinion certain that, in cases not so complicated, the chances of success after the operation are in direct proportion to the promptness with which it can be performed after the accession of the symptoms indicating its necessity. This stands to reason if the view I have taken of the causes of death in the case before us be correct, for it is evident that the earlier performance of the operation will give the patient a better chance of escaping the bronchial and pulmonary complications produced by the local obstruction to respiration.

It remains to consider the question of proper management after the operation; for however successfully this may have been performed, the danger is not therefore over—our duty is but half done. The operation has indeed warded off death in its lately threatening form, but the disease remains. A respite, however, has been secured, during which the patient may possibly pass safely through the illness; for though diphtheria has not the definite duration of some other diseases, it does, nevertheless, wear itself out in time, and the patient recovers if he can be kept alive long enough. Next, therefore, in importance to the immediate success of the operation, is the after-management of the case, which resolves itself

mainly into three principal points—viz., the clearing away as far as possible of all obstructions to respiration, the prevention of all causes of catarrhal irritation, and the liberal administration of the best kinds of nourishment. To secure the first of these objects not only must the inner canula be carefully kept clear, being removed for that purpose at least once in two hours, but any mucus or loose flakes of membrane within sight of the orifice should be carefully removed as soon as they are discovered, otherwise they will be drawn in again by the act of inspiration. Any accumulation of mucus, or any loose false membrane below the opening can of course only be expelled by coughing, but their expulsion may sometimes be facilitated, when the patient's strength permits, if from time to time, when he has taken as deep an inspiration as possible, the finger of the attendant be momentarily placed on the mouth of the canula, and then suddenly removed when the effort to cough has been excited. The supervention of catarrhal irritation is to be guarded against by protecting the patient from inhaling either too cold, or on the other hand too dry, warm air. It has been usual in the hospital to endeavour to secure these objects by placing the patient's bed near the fire, surrounding it closely with curtains and screens, and at the same time moistening the air of the little chamber so contrived, by directing into it a current of steam through a tube attached to the spout of a large tea-kettle. Being, however, of opinion that pure air and free ventilation are quite as indispensable as warm and moist air, I have tried several modifications of this plan with private patients, but, on the whole, incline to the plan, originally suggested by Trousseau, of covering the mouth of the canula with a knitted woollen veil, or a wide piece of muslin, applied loosely round the throat like a cravat, in such manner that the patient's breath may warm and moisten it as he exhales, and that it may in turn warm and moisten the air he inspires without impeding the free renewal of air around him. Lastly, in a disease characterized by such extreme depression, it is essential to give the patient an adequate amount of support in the form of food and wine; bearing in mind always that not the actual amount administered, but only the amount which can be assimilated, will do the patient good. So all important do I consider the keeping up of the patient's strength by means of nourishment, that I never hesitate to abandon any medicine when I find that its administration prevents the taking of a sufficient quantity of food. For the same reason I can lay down no positive rules as to the kinds of food to be given; they should be not only nutritive and easily taken, but, as far as possible, acceptable to the patient. Very strong beef-tea, jelly, eggs and milk, with wine or brandy at frequent intervals, will generally be the best diet for some little time after the operation. If, a day or two later, liquids begin to regurgitate through the nostrils and to find their way through the canula, which I attribute to the accession of the secondary paralytic symptoms so common after diphtheria, then it is necessary to have recourse to soft or soaked food, which can be swallowed with greater facility than liquids, and with greater certainty of conveying the required nourishment.

At the beginning of my lecture I proposed to relate successively two cases as examples of the two principal forms of diphtheria. We have now fully considered the case belonging to the first of these forms, and have dwelt upon the special means available to meet the local danger; it remains therefore now to give you the history of the case belonging to the other form.

W. M———, aged fifteen years, was admitted into Cambridge ward, under my care, on Dec. 29th, 1864. Six days before admission the boy had complained of sore-throat and of difficulty in swallowing. His appetite had failed; he became feverish and so prostrate in strength that he took to his bed. On admission into the hospital his face was flushed and his expression anxious; his skin was hot; pulse 94, feeble and easily compressible; tongue coated with a thick white fur on the dorsum, red at the tip and edges; urine normal. The glands at the angles of the jaw were swollen; he had much difficulty in swallowing; the soft palate was red and pulpy-looking, and bled on being accidentally touched with the spatula; both tonsils were enlarged and inflamed, and upon the right one there was a small patch of adherent exudation. I ordered a large hot poultice to be applied round the throat, and the tonsils and soft palate to be lightly brushed over twice a day with a mixture of the tincture of sesquichloride of iron and honey in equal parts. I prescribed

a draught containing fifteen minims of tincture of sesquichloride of iron, five minims of diluted hydrochloric acid, five grains of chlorate of potash, and an ounce of caraway water, to be taken every six hours; and ordered as diet, milk, strong beef-tea, eggs, and sherry.

There was no material change in the patient's state on the 30th, and the same treatment was continued, excepting that a thick padding of cotton-wool was substituted for the poultice round the throat. On the two following days he appeared somewhat better; he slept well, and said that he felt stronger. The tongue was less coated, and the injection of the soft palate had greatly diminished, but the tonsils remained large, and seemed to be superficially ulcerated. The boy's skin was cool, his breathing quiet, and he took wine, beef-tea, and other liquid nourishment freely. On the evening of the second day, however, vomiting supervened; he slept badly, and next day (Jan. 2d) was much more prostrate. His pulse was reduced to 76, and was very feeble. The voice had become hoarse and rather nasal, and there was a thin sanious discharge from both nostrils. The glands at the angles of the jaw were hard, swollen, and tender, especially on the left side. The soft palate and the pillars of the fauces were again deeply injected and œdematous, and there was a patch of exudation of the size of a split-pea on the left tonsil. The urine had an acid reaction, and, for the first time, contained one-fifth of albumen. He retched from time to time, mostly after taking food, and brought small quantities of glairy mucus tinged with blood. On Jan. 3d there was slight epistaxis; the vomiting continued; there were patches of exudation on the posterior wall of the pharynx; and the urine contained one-fourth of albumen.

Jan. 4th.—The soft palate and fauces on the right side were more injected, and the right pillar was perforated by a small ulcer. Pulse 72, very weak and compressible. Only about an ounce and a half of urine had been passed during the last twenty-four hours, containing more albumen than before.

Throughout the following day he continued to sink; complete suppression of urine took place; he refused both food and medicine, and died early on the morning of Jan. 6th.

At the post-mortem examination the soft palate and pillars of the fauces, with the parts at the base of the tongue, the epiglottis and the aryteno-epiglottidean folds, were found to be very œdematous. The mucous membrane of the fauces was intensely red, and on the uvula was a small yellowish-white patch of slightly adherent false membrane. The tonsils were much enlarged, and on the inner aspect of each was an ulcer with a sloughy surface. The tissues surrounding the tonsils were infiltered and brawny, the tonsils themselves very hard, of a brownish-red colour on section, and sloughy in the centres. The under-surface of the epiglottis was covered by a yellowish, slightly adherent patch of false membrane. The mucous membrane of the trachea was reddened and somewhat rough, especially towards the lower end; that of the larger bronchial tubes was intensely injected. The tubes going to the lower lobe of the right lung contained a moderately firm black coagulum. Beneath the pulmonary pleura on both sides there were numerous minute ecchymoses, and also a few similar spots beneath the pericardium at the base of the heart. In the lungs were several sharply-bounded masses of pulmonary apoplexy, the intervening pulmonary tissue being congested, but everywhere crepitant. The kidneys were rather large, the cortices pale, and the pyramids congested. The mucous membrane of the stomach was injected, and towards the lesser end were several small extravasations; the surface of the membrane was covered with a layer of viscid mucus streaked with blood. The mucous membrane of the smaller intestines was also reddened, and towards the lower part of the ileum vividly injected, with here and there small ecchymoses in its substance.

In this case obviously the patient died (as I have already said), not from the local effects of the disease, but from the severity of the constitutional affection. This was manifested during life by the excessive prostration, loss of appetite, albuminuria and vomiting, and, after death, by the pulmonary apoplexy, the ecchymoses on the heart and lungs, the extravasations upon the mucous membrane of the stomach and small intestine, and the congestion of the kidneys. These symptoms and post-mortem appearances, taken together, clearly prove the patient to have been suffering from a general dyscrasia, the consequence of blood-poisoning.

I must now direct your attention to an

important point in the history of the case. Observe that the patient did not go on getting progressively worse from day to day, but that there was a period during which a manifest improvement took place, followed by the symptoms of severe constitutional disturbance which preceded death. I have now watched several cases presenting the same characters, in all of which a visible amendment of the earlier symptoms was followed by a train of constitutional symptoms precisely analogous to those which occurred in our patient, and sometimes also by purpura or ecchymosis of various parts of the body. I have only had the opportunity of making a post-mortem examination of two of these cases, and in both of them I found extravasations of blood on the internal organs, and, as in the case before us, sloughing of the tonsils.

Taking into consideration all the facts in the history of these cases, and especially the interval of amendment before the development of the constitutional symptoms, I am of opinion that these are due not so much to the primary cause of diphtheria as to a secondary tainting of the blood arising from the local disease in the fauces. Doubtless, even at the time of the apparent amendment, the tonsils were infiltrated with exudation, which led to sloughing in their centres, and this to the blood-poisoning, which manifested itself in the general symptoms and appearances described.

In some cases of this form of diphtheria the interval of amendment is longer and more marked than it was in our patient, thus showing, it seems to me, more clearly the secondary origin of the grave train of constitutional symptoms. Some time since I was called by the family medical attendant to see a little boy who had already been suffering from diphtheria for twelve days. The child was cheerful and able to take nourishment; there was but very little swelling or tenderness at the angles of the jaw, the injection of the fauces had greatly subsided, but the tonsils had a ragged appearance, and were partially covered with exudation. For several days he continued apparently to improve, though very slowly, and we still hoped he would recover, until one day a slight epistaxis occurred, albumen appeared in the urine, the throat again became injected, a few patches of purpura appeared on the extremities, retching set in with vomiting of glairy mucus streaked with blood, and he died on the twenty-fourth day of his illness. No post-mortem examination was made, but, from all the symptoms and appearances of the case, it obviously belonged to the same class as the three similar cases which I have been able to examine.

I must by no means be understood to imply that this course, with a longer or shorter interval of amendment, is the only course taken by cases of diphtheria in which the danger arises from the severity of the constitutional affection; on the contrary, you must have seen, and I could quote if time allowed, many cases in which the pharyngeal and constitutional symptoms went on progressively from day to day until the turning point, when the patient either began to recover or sank and died. I wished, however, on this occasion, to direct your attention especially to this particular course of the disease, on account of its bearings upon prognosis and upon local treatment.

As regards prognosis, we must evidently bear in mind the possible appearance of the secondary symptoms, even after the patient has seemed for some days to be going on well; and in my experience their actual supervention has always been of the gravest augury, for, coming as they do when the patient has been more or less exhausted by the primary illness, his chance of struggling through them is very small.

As regards local treatment, the importance of the lesson to be derived, according to my view of the case, can scarcely be over-estimated. Many practitioners are very fond of powerful topical applications in diphtheria. They rub the tonsils with solid lunar caustic, or they paint them two or three times a day with a strong solution of nitrate of silver, or with hydrochloric acid or Beaufoy's solution of chlorinated soda. At one time it was not unusual to rub away the exudation forcibly by means of probangs or other contrivances, in order to allow the direct access of these powerful applications to the diseased membrane, and I believe that these rough modes of procedure are not yet entirely abandoned. If, however, you consider that the mucous membrane, even in mild cases of diphtheria, is inflamed, œdematous, often tender, and liable to bleed at the slightest touch; and that, further, in cases of any severity the mischief extends to the deeper tissues, the exudation being

not merely superficial but also interstitial, and that either ulceration or, as in our case, deep-seated sloughing is apt to follow, you will easily understand the uselessness, and even the danger, of such severe measures I need scarcely tell you that in a part the vital powers of which are already depressed, nothing should be done to aggravate the morbid tendencies which exist; and with regard to the exudation, I feel assured, from observation, that it goes on more rapidly after the surface has been artificially cleared Viewing the exudation therefore somewhat in the same light as I should a scab upon a wound, I am accustomed to be very chary of meddling with it, and rather strive to preserve it intact until it comes away naturally than to favour its detachment. But although I warn you against rough measures and violent applications, on the other hand I have seen great benefit derived from milder local treatment. In the early stage of the disease the tincture of sesquichloride of iron often has a marvellously beneficial effect upon the inflamed and injected parts, and its styptic action has a tendency to check further exudation when this process has already commenced. I therefore cause the fauces to be gently painted with it, either pure or mixed in equal parts with glycerine or honey, repeating the operation at most twice a day. When once the inflamed surface is thickly covered with deposit I cease to use any but detergent applications, such as tepid water, or weak solutions of chlorate of potash, alum, or perchloride of iron, either as gargle or injection. Where there is any offensive odour from the throat I substitute for these a weak solution of permanganate of potash, or of chlorinated soda.

Lastly, with regard to medicines, although I cannot pretend to the knowledge of any specific for diphtheria, I have found the tincture of sesquichloride of iron, in full doses proportioned to the age of the patient, by far the most valuable of the remedies in use for the asthenic form of the disease, especially in cases, which are attended by albuminuria, or in which the fauces are deeply injected and tender. When there is a hemorrhagic tendency, it is well to add to the tincture of iron a few drops of diluted hydrochloric acid. In those milder forms of the disease in which there is but little constitutional disturbance, the chlorate of potash mixture, with or without small doses of the tincture of iron, is, in my experience, the best remedy both internally and as a gargle. But in the matter of medicines, as I have already said with regard to nourishment, I can give you no absolute or precise directions. In this, as in all the other branches of treatment, it is only by careful and constant watching of every fresh symptom, and by making immediate provision to the best of our art against every fresh emergency, that we can hope to bring our patient safely through an illness so variable in form, and generally of so serious a character.—*Lancet*, July 22, 1865.

HOSPITAL NOTES AND GLEANINGS.

Primary and Secondary Syphilitic Sores on the Eyelids.—It is very rare to meet with a primary syphilitic sore on the eyelid, though secondary ulcers are not unfrequently seen. In the first of the following cases there can be no doubt that the sore on the upper eyelid was a chancre. How inoculation could have been effected it is difficult to conjecture; but the combined facts of its syphilitic appearance, its indurated base, the enlarged gland behind the ear, the eruption over the body, and the rapid manner in which it healed under the influence of mercury, establish beyond a doubt its syphilitic nature.

Secondary sores on the eyelid are often difficult of diagnosis, as in many cases they closely resemble epithelial ulcers; but in cases of doubt, a week or ten days' treatment with anti-syphilitic remedies will usually decide their true origin. A syphilitic sore generally commences close to the tarsal edge of the lid, which it partially destroys, leaving a notch which is somewhat characteristic. It will heal at the point where it first commenced, whilst it extends in the opposite direction; whereas in the epithelial sore there is no real repair of the ulcerated surface: it may scab over in one part, and become dry; but a reformation of healthy tissue seldom takes place. The previous history is a very material guide; but syphilis is so often vehemently denied by patients who have suffered from it, that reliance cannot always be placed on their statements with regard to it.

The four following cases are good and instructive examples of this form of malady.

Case 1. *Primary syphilitic sore on the upper eyelid of an infant, followed by a secondary eruption over the body.*—J. F——, aged one year and ten months, came under observation on January 24th of this year, on account of a troublesome sore on the upper eyelid of the left eye, which showed no disposition to heal. The mother stated that it commenced a fortnight before Christmas as a pimple on the upper eyelid, at the inner side, and near its tarsal edge. The child scratched it, and it became a sore, which has increased to its present size.

Present state.—There is a large, somewhat oval-shaped sore, rather more than half an inch in length, and about a quarter of an inch in depth, extending into the tarsal edge of the lid, which has been partially destroyed, and presents a sharp notch. The edges of the ulcer are indurated, and its surface is glazed. The mucous membrane of the upper lid is œdematous, and discharges a muco-purulent secretion. There is an enlarged gland behind the ear, and the whole of the body of the child is covered with roseola. The child appeared very feeble, and much out of health. It was more than five weeks since the ulcer first appeared, and, although local applications had been used, not the slightest benefit had been derived. Ordered, a grain of mercury with chalk night and morning, and dilute citrine ointment to the ulcer.

This treatment was continued until the 7th of February, when she was ordered to omit the powder in the morning, but to take one every night. The wound now speedily assumed a healthy action and began to cicatrize.

On Feb. 14th the sore on the eyelid was quite well, the rash over the body had entirely disappeared, and the child was much better in health and had grown much fatter.

Under the subsequent use of the syrup of iodide of iron, the child on the 10th of March was quite well, but was ordered to be brought to the hospital from time to time, to be under observation.

Case 2. *Secondary syphilitic sore on the upper eyelid.*—Chas. T——, aged forty-nine, admitted Nov. 22d, 1859, suffering from an ulcer on the upper eyelid at the inner part, and involving its free border. The sore was irregular in outline and somewhat oval in shape, healing in one point and extending itself at another. It commenced at the tarsal edge, at the point which now exhibits a deep notch. He states that he has never had syphilis, but the mucous membrane of his tongue is thickened and rugose, and presents all the appearance of a syphilitic tongue. He was ordered iodide of potassium thrice a day, with Plummer's pill every other night, and to apply dilute citrine ointment to the sore.

By the 18th of December the wound was quite healed.

Case 3. *Secondary syphilitic ulcer involving the inner angle of the eyelids.*—Sarah P——, aged twenty-three, married three years, applied at the hospital July 31st, 1860, on account of a large sore near the inner angle of the eye, which was encroaching upon the margin of both the upper and lower eyelids, close upon the caruncle.

Present state.—The ulcer is rather larger than a sixpenny piece, but irregular in outline. Its edges are inflamed and thickened. It has an unhealthy appearance, and although a portion of it has healed at its lower border, in the opposite direction it is extending itself upon the eyelids. She says she has never had syphilis; but she has lost the bridge of her nose, and is now suffering from a fetid discharge of the nostrils, which she has had for the last six years. She has great hoarseness, which came on about eighteen months ago, and has continued ever since.

Under the same treatment as in Case 2, the wound rapidly healed.

Case 4. *Secondary syphilitic ulcer on the upper eyelid of four months' duration.*—George A—— came to the hospital, on Dec. 18th, 1860, with an oval-shaped ulcer of the upper eyelid, involving the tarsal edge of the cartilage, and extending upwards on to the integument of the lid. Around the margin of the sore there was considerable thickening, and the surface of it had a glazed appearance. He had suffered from it for four months.

On Jan. 15th, 1861, the sore was quite healed under the same plan of treatment as in the two previous cases.—*Lancet*, May 6, 1865.

MEDICAL NEWS.

DOMESTIC INTELLIGENCE.

A Glass Pessary remaining in the Vagina fifteen years.—Dr. Collins exhibited

to the Providence Medical Association a glass pessary which had been worn without removal for fifteen years.

It was introduced by Dr. L. L. Miller, of Providence, in June, 1850, when the patient was upwards of sixty-five years old, and was removed by Dr. C., in July, 1865, when she was upwards of eighty.

The pessary was the usual circular perforated glass disk, two inches and three quarters across. Its presence, at the time of its removal, was producing much irritation, giving rise to a copious offensive discharge, with much disturbance of the bladder. The removal was attended with much difficulty and considerable suffering, owing to the atrophy of the parts from age.

Boston Med. and Surg. Journal, Oct. 5, 1865.

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Transactions of the American Medical Association for 1865.—It is announced that the price of the forthcoming volume will be five dollars, and those members who have already paid three dollars are requested to forward the additional two dollars to the Treasurer, Dr. Caspar Wister, No. 1303 Arch Street, without delay. Members who have not yet paid, and who desire the volume for 1865, should forward five dollars to the same address forthwith to prevent disappointment, as the number of copies printed will be but slightly in excess of the number subscribed for.

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New Orleans School of Medicine.—The sixth annual course of lectures will be opened in this school on the 13th of November. The following constitute the Faculty: E. D. Fenner, M. D., Professor of Theory and Practice; D. Warren Brickell, M. D., Professor of Obstetrics and Diseases of Women and Children; Sam. Choppin, M. D., Professor of Operative and Clinical Surgery; C. Beard, M. D., Prof. of Principles of Surgery; J. L. Crawcour, M. D., Prof. of Chemistry and Legal Medicine; Howard Smith, M. D., Professor of Materia Medica and Therapeutics; A. C. Holt, M. D., Professor of Physiology.

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The Physicians' Visiting List, Diary and Book of Engagements, for 1866.—Messrs. Lindsay & Blakiston have issued this well-known and useful volume for the forthcoming year.

Obituary Record.—Died at his residence in Middletown, Conn., suddenly, September 26, 1865, Prof. Chandler R. Gilman, of the College of Physicians and Surgeons of New York.

At a meeting of the Central Medical Association held at Middletown, Wednesday, Sept. 27, the following resolutions were adopted:—

Resolved, That by the recent sudden decease of Prof. Chandler R. Gilman, M. D., of the College of Physicians and Surgeons of New York, our profession sustains an irreparable loss, a loss all the more keenly felt by us, who during the past two years since he took up his residence among us, have learned to love and honour him no less for those eminent professional and scientific attainments for which he was so long and widely distinguished, than for the cheerful, kindly, genial qualities of mind and heart which he ever displayed amid all his physical suffering.

Resolved, That we extend to his afflicted family and his fellow physicians in New York our warmest sympathy.

Resolved, That as a testimonial of our regard and respect for our deceased friend and his bereaved family this Society attend the funeral services to be held Thursday, Sept. 28, at his late residence.

Resolved, That the Secretary be directed to furnish a copy of these resolutions to the family, and also to give them publicity.

A true copy, Geo. W. Burke, *Sec'y*,
Central Med. Association.

FOREIGN INTELLIGENCE.

Precautions against Cholera.—[The Epidemiological Society, the highest authority in all that regards epidemics, have lately presented to the Privy Council of Great Britain the following memorial on the subject of cholera. The facts therein set forth should receive the earnest attention of every municipal government in this country.]

"The Epidemiological Society, ever since its foundation immediately upon the cessation of the epidemic of cholera in 1849, has had its attention in a special degree directed to the investigation of the disease as it has appeared both in this country and abroad. Many of the original members had been engaged in carrying out the inquiries insti-

mined by the General Board of Health during that visitation, and were again employed on like duties in the epidemic of 1853-4. Other members have had extensive experience of the pestilence in the East Indies and other tropical countries; and, in almost every Session, communications illustrative of its characters have been read and discussed at the meetings of the Society.

"From the earliest intelligence of the present epidemic, when it appeared last June in Egypt, its history has been sedulously watched by a Committee, for the purpose of comparing its course with that of the former European epidemics which, after ravaging various countries on the Continent, at length reached our own shores; and, with the view of forming such practical conclusions as might guide the mind of the Profession, and of the public generally, in regard of the precautionary measures best calculated to protect the country against an invasion, and, if that should fail, to mitigate to the utmost its destructive effects among the people.

"With respect to any endeavour to exclude epidemic cholera by the system of quarantine such as was formerly practised in this country, and as it is still adopted and being carried out at the present time in all the Mediterranean seaports, the experience of the visitations in 1832, 1848, and 1853 appears to show conclusively that no reliance whatever can safely be placed upon it to keep off or avert the pestilence. Moreover, while the adoption of quarantine serves to give delusive hopes to the public mind, it generally leads to the unwise postponement of those internal measures of local improvement which afford the surest defence against the dangers of the assault. Sanitary precautions within a place are far more important than sanitary cordons without.

While discountenancing the practice of an enforced detention and segregation, for a specified number of days, of all arrivals from an infected country—irrespective of the condition of the vessels themselves and of the persons on board, whether the former be thoroughly clean and airy, or foul, close, and crowded, and whether the passengers and crew be sick or quite healthy—the Council of the Epidemiological Society are, at the same time, strongly of opinion that the interests of the public health require that an efficient sanitary supervision should be exercised in all our chief sea and river-port towns, and that the most beneficial results, not only to these places themselves but to the country generally, may be expected, on the threatened advent of an epidemic, from the timely adoption of such a precaution.

"It is to be observed that, in the successive visitations of the cholera in this country, the disease always manifested itself first on or near the sea-coast, and in some large busy port.

"In 1831 the earliest cases occurred in Sunderland during September, and Newcastle was attacked about three weeks later.

"In 1848 the disease seems to have appeared about the end of September in several places on the east coast—viz., Hull, Sunderland, Edinburgh, and the metropolis—at nearly the same time.

"The visitation of 1853 may be said to have commenced with the outbreak at Newcastle in the month of September, which proved so destructive to life and so hurtful to the commercial interests of the town.

"Besides the marked tendency in epidemic cholera to appear first on, or near to, the coast, it is also to be observed that many of our seaport towns have suffered with unusual severity in more than one of the visitations—witness Newcastle, Sunderland, and Hull, Glasgow, Liverpool, and Bristol, Plymouth, Portsmouth, and Southampton, Sheerness and London. The damp low sites of the worst parts of these towns, always in the vicinity of their harbours and docks (which are in themselves often prolific of malarious effluvia), together with the filthy and crowded dwellings to which seamen generally resort, and their reckless intemperate habits, cannot fail to aggravate other sanitary evils, and greatly to increase the predisposition of a maritime population to epidemic influences. The unfavourable state of the health, too, among the crews of many merchant ships upon their arrival in consequence of the neglect of hygienic precautions during the voyage, renders them peculiarly susceptible of a poisonous atmosphere in the port; and there is good reason to believe that on several occasions where the earliest cases of an epidemic disease have occurred among persons recently arrived, this has been due rather to the cause just mentioned than to those persons having imported the disease from abroad. In the case of river-ports becoming infected,

the disease, from its tendency to follow the line of water communication, has often been observed to make its way thence upward into the interior of a country.

"In view of these considerations, the Council of the Society beg respectfully to state that in their opinion it is highly desirable, for the welfare of the kingdom generally, that a sanitary inspection be made of the principal seaport towns to ascertain their actual condition, more especially of their harbours, docks, shipping, dwellings for seamen, etc., and with the view of discovering what provisions or arrangements exist for the reception and treatment of cases of sickness in ships upon their arrival from abroad, in the event of the cholera making its appearance in the port.

"With regard to the health condition of the general population, the Council take leave, with great respect, to express their entire concurrence in the fitness of the timely precautionary instructions which have been already promulgated by the Privy Council; and, while they are well aware of the insufficiency in many respects of the existing laws for the prompt and effectual correction of numerous sanitary evils which seriously endanger the health of the humbler classes at all times, and especially in an epidemic season, they leave with confidence to the wisdom of the Government to determine the time when it may be necessary, by the issuing of a special order, to confer upon local authorities larger and more summary powers for the prevention of disease and the protection of the public health."—*Med. Times and Gaz.*, Sept. 30, 1865.

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Remedies for Cholera.—The foreign journals are filled with announcements of the most extraordinary infallible cures for Cholera. The *Union Médicale* suggests that it would be a saving of time to enumerate the things which have *not* been proposed as remedies in cholera.

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Transfusion of Blood.—Dr. PANUM, in his observations on Transfusion of Blood, has come to some important conclusions. Defibrination of the blood, he says, exerts no particular influence over the excretion of urea. The fibrin is quickly reproduced, and, in fact, becomes normal again in forty-eight hours. The fibrin again exercises no influence on the restoration of vital manifestations—a fact which proves that this substance is only a secondary product of tissue-formation, and not, as has been hitherto held, a body presiding over their formation. Hence, therefore, defibrinated blood must be held as infinitely superior to non-defibrinated blood when used for injections; because, by its use, the danger resulting from the injection of clots is avoided, and because defibrinated blood is more highly charged with oxygen than ordinary venous blood. Healthy human blood should always be employed; because, spite of experiments which always show that in animals the blood of an allied species may be used, there is always danger of its undergoing decomposition. The fibrinated blood may be preserved in ice, and warmed when employed in injections; but fresh blood is always preferable. When the case is urgent, there is no need for heating the blood to the temperature of the body; nor is there any danger in injecting large quantities of blood into the vessels. The surgeon should not wait until the last moment before he proceeds to the injection; because the operation is not in itself dangerous, if all due precautions be adopted in its performance.—*British Med. Journal*, Sept. 9, 1865.

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Aneurism of the Thoracic Aorta diagnosed by means of the Laryngoscope.—Dr. POTAIN gives, in *L'Union Médicale*, an interesting case of this. The patient suffered mainly from cough, aphonia, and dyspnœa, and was treated for laryngo-bronchitis. But as the treatment had no effect, M. Potain, convinced that the mischief lay in the larynx, examined the organ with the laryngoscope; and, to his surprise, found the mucous membrane in a perfectly healthy state. The cause of the aphonia, however, was at once explained by a complete paralysis of the left vocal cord. Hence, it appeared probable that the left recurrent nerve was affected in some part of its course. On further investigation, M. Potain was able to observe deep down in the trachea on its left side a reddish and projecting surface, which prevented the first division of the bronchi from being seen. No pulsation, however, was observed in it. This fact, however, with certain auscultatory signs, led to the diagnosis of aneurism, which was confirmed by autopsy. The recurrent nerve was found closely pressed between the tumour and the trachea; it was flattened and transformed into a kind of

ribbon, and could only be recognized by its continuity with the pneumogastric nerve. All the laryngeal muscles supplied by the left recurrent were more or less atrophied —*British Med. Journal*, Sept. 9, 1865.

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Medical Evidence in Relation to State Medicine.— [Those ignorant of the circumstances of the case, are in the habit of discrediting the profession for the evidence given by them in courts of justice. The want of clearness and preciseness in the testimony of medical men usually arises not from ignorance on their part, but in the difficulty of making their statements intelligible to the uninstructed minds of the court and the public. Dr. J. A. SYMONDS has placed this subject in the proper light, in the following extract from a paper read by him before the British Medical Association at their Leamington Meeting.]

"I think we must be all agreed that medical evidence in courts of law is not what we could wish it to be, whether with reference to what is just and what is creditable to the profession, or to what is required by the interests of the public. And, first, let us consider it with respect to ourselves —our character, rights, and interests.

"Medical evidence in general—that is, with the exception of the evidence specially given by *experts*—is *mixed* evidence. It is partly common, and partly professional or scientific; for it testifies both to what might have been seen and heard by any person who happened to be present at certain transactions, and also to what could have been correctly observed only by instructed senses. Likewise, it embraces inferences from the facts observed—inferences that have the authority of the presumed scientific judgment belonging to a well-informed practitioner of medicine.

"The quasi-scientific evidence of the medical witness is not delivered in the form of a written report, carefully considered and carefully expressed; but it is given *memoriter*, *viva voce*, and for the most part in answer to questions propounded by persons to whom the subject is new, and to be heard and understood and estimated by persons who have no knowledge whatever of the subject scientifically considered.

"The evidence, though often involving nice and scientific distinctions both as to description and as to inference of cause and effect, has to be delivered by the medical witness in language as free as possible from the terminology through which much of his professional knowledge was learned, and which very terminology was invented to convey knowledge which could not be expressed with requisite precision in common language.

"Again, the evidence is often of a kind that involves minute investigations, and an exact knowledge of subjects that may not be actually required by a medical man more than once or twice in a lifetime, however experienced and eminent he may be as a practitioner. He may have got up the subject thoroughly when going through his academic curriculum, and he may be an old man before he has had to draw upon such knowledge for juridical purposes. It may have been as latent, or unemployed, or well-nigh forgotten, as the processes and foramina of the sphenoid bone or the reflections of the peritoneum; or as the natural history of some plant, in some remote corner of the globe, that furnished some dusty old drug once in favour with doctors; or as the composition of some obsolete but once fashionable pharmaceutical formula. Which of us would like to have to recount on a sudden the ingredients of pulvis contrayervæ compositus? And which of us would like to have to tell all the proofs that an infant had never lived an extra-uterine life?

"Let me endeavour to relieve the dulness of this part of my communication, by relating what on one occasion passed between a most eminent member of the legal profession and myself, not in a court of law, though at a public meeting. After a learned and highly interesting lecture on certain points of the English language, delivered at the Bristol Institution, by the Rev. J. Earle, formerly Professor of Anglo-Saxon at Oxford, a vote of thanks to the lecturer was proposed by a legal friend, a gentleman not more eminent by the high office which he holds, than distinguished by the ability and philanthropic zeal with which he has instigated various social reforms. In the course of some most valuable remarks on language, he said that those spoke best, and with most clearness and precision, who thought least of the effect which what they were saying would produce upon their hearers; and he declared that it was the want of such unconsciousness that made medical witnesses the worst of all witnesses in courts of law. And he clenched his remarks by

alluding with playful malice (seeing that many of his medical friends were present) to a very sarcastic account of medical evidence in cases of lunacy with which a Lord Chancellor amused the House of Lords a few years ago. It happened to be my duty to second the vote of thanks; and I should have been a recreant, had I not availed myself of the opportunity of endeavouring to wipe away the aspersions cast by my learned friend on the character of medical witnesses. I ventured to say that, whatever psychological or philological truth there might be in the remark that a speaker should be free from self consciousness or thought in regard to the effect of his words, yet my learned friend had omitted to mention the chief cause of the disadvantageous figure made by medical witnesses, which was, that they had to speak of things about which their audience, including the simple-minded jurors, the quick-witted gentlemen of the bar, and even the august occupants of the bench, were profoundly ignorant; and, moreover, that such witnesses had to translate as they were speaking, to put aside the language in which their professional knowledge and ideas most naturally flowed, and to accommodate what they had to say not only to the uninstructed understanding of their hearers, but also to the vernacular language; that, in the course of this process, much might be lost both of force and accuracy; and that the process required some presence of mind, especially under cross-examination, which mental quality was not likely to be aided by a severe injunction from the bench to give a plain answer to a plain question, or by an ironical petition from counsel that the witness should for the time being disencumber himself of his superfluous learning, and condescend to the language of ordinary mortals. And, as to the allusion to the Lord Chancellor's mocking description of medical evidence, I could only say that, till I read his lordship's speech, I did not think that even a Lord Chancellor could, upon a medical subject, display so singular a lack of information After the meeting, my friend told me that what I had said was not only fair in the way of retort upon an antagonist, but also that it was strictly and literally true."—*British Med. Journ.*, Sept. 2, 1865.

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Sewers and their Evils.— [While the importance of subsoil drainage is almost universally admitted, it must be acknowledged that there are attendant evils which it is of the utmost importance to obviate. How best to get rid of the gases generated in these receptacles and to prevent the evil effects resulting from their escape, is now attracting as much attention in England as the economical question, of how most effectually to *utilize* the fertilizing properties of the contents of these sewers. The following remarks on this subject, in an editorial in the *British Medical Journal* (Sept. 9, 1865) are worthy of consideration.]

"The immense extent of our [London] present system of sewerage probably converts the sewers into one enormous cesspool. It was, of course, the decomposition of animal excrements which gave rise to the dangerous vapours issuing from the cesspools. Now, if these excrements are allowed, in consequence of the length of the sewers through which they now have to pass, to decompose, as they decomposed in the ancient cesspools, why should not the vapours and gases arising from the decomposition in the sewers produce as noxious effects as they produced when they escaped from the cesspools? We some years ago suggested this question, Whether our present system of sewage would not become one enormous cesspool; and whether some special provision ought not to be made for the escape, by high shafts, or neutralization of the products of decomposition. If it be true that the contents of our sewers in London undergo decomposition just as they underwent decomposition in the old cesspools, surely it was something akin to madness to set loose all the products of the decomposition at our very doors and under our very noses. But all this matter requires investigation; and interesting would it be, if we could get some sure information as to the ordinary health of those men who pass many hours in these sewers, and whom we occasionally see emerging from iron traps, with lantern and heavy jack-boots. What effect does the inhaling of the vapours of sewers have upon them? Perhaps some of our readers can tell us something of this; and we may add, that we wish Dr. Fuller had furnished the *Times* with some positive proof that the issue of gases from sewers had injured human constitutions and produced diseases.

"Dr. Miller, Professor of Chemistry in King's College, says truly enough, that

sewers must be ventilated—*i. e.*, the gases must be let out of them—so long as it is necessary for men to pass through them; and he recommends the process of ventilation and disinfection proposed by Dr. Stenhouse.

"'It consists in suspending charcoal in the ventilating openings. In London, the plan has been carried out by the engineer to the Commissioners of Sewers, with the sanction of Dr. Letheby; and both these gentlemen have reported strongly in its favour. There is placed in each ventilating opening a box, within which are three or four perforated shelves, and on each of these shelves is a layer of wood charcoal; openings are made at the top and bottom of the box, to allow the free passage of the air; the whole of the air which escapes from the sewer is obliged to pass through the box and over the charcoal before it reaches the outer atmosphere. The offensive and noxious gases are speedily absorbed by the charcoal, and are oxidized within its pores, by which means they are converted into a harmless substance, destitute of odour. The method is so simple and so effectual,' says Dr. Miller, 'that it ought at once to be put in practice, while yet there is time.'

"Again, Dr. Fuller, in a second letter, objects to the process recommended by Dr. Miller, that it is unsafe and unsatisfactory; and recommends an arrangement of ventilating shafts.

"'There can be only one effectual remedy—viz., to trap all the gully-holes and close the innumerable vent-holes with which our roads are perforated, placing in their stead a few large—not necessarily lofty—shafts and openings along the main sewers, through which a thorough system of ventilation could be carried on. Over these ventilators furnaces might be erected to burn the gases, or charcoal air-filters might be placed, if it can be proved that charcoal is no less efficacious as a disinfectant than it is admitted to be as a deodorizer.'

"Dr. Letheby, on the other hand, confirms Dr. Miller's statement; and says that, in a densely populated district of London, the experiment has been carried on with success since 1860.

"'The results of it are, that the deodorising power of the charcoal has been very complete; for not only have there been no complaints of unpleasant smells from the ventilating openings, but we have ascertained by actual observation that the odour of the sewer gases is not perceptible when they have traversed the charcoal-filters. . . . The effect of these air-filters in the ventilation of the sewers is not perceptibly injurious; there is no complaint of bad air from the sewer-men, and analysis of the sewer-air shows no difference in the composition of it.'

"Dr. Herbert Barker, who has proved himself to be a high authority on the subject of disinfection, speaks of ozone as being 'Nature's grand atmospheric disinfectant.' His observations are of much interest, and the practical conclusions recommended worthy of consideration, especially in reference to this matter of the cholera. We conclude that Dr. Barker has satisfactory proofs of the fact that ozone is really absent in the district where cholera rages, etc. Of course, the full establishment of this fact is very important,

"'In the neighbourhood of cesspools, all evidence of the presence of ordinary atmospheric ozone is lost. When ozone is abundant in the air, it may be detected on the windward side of a stable, or cowshed, or manure-heap, but not on the leeward side. It may be observed abundantly immediately on the windward side of a town, and not a trace of it discovered at the same time on the leeward side. The ozone test-paper in an ill-ventilated church, when full of persons, will give no reaction. I have evidence from my own experience that the diffusion of ozonized air through the apartments of persons suffering from fevers is of immense service, in that it keeps the room free of oppression, and effectually destroys the offensive odours arising from the gaseous excreta of the subject. Ozone, in its action as a deodorizer, closely resembles chlorine. It can be employed permanently by a single process with ventilation. Ozone may be prepared by Siemen's cylinder, the air driven through the cylinder being ozonized by sparks from Ruhmkorf's coil. This method can be adopted only in hospitals, as skilled hands are required for its management. Fortunately, we have a means of generating ozone from phosphorus, which is ready for use at any moment, and with little trouble. Two sticks of phosphorus, each two inches in length, made very clean by scraping, if covered with oxide, and half covered with water, will yield in an hour sufficient ozone, in a room of 3,000

cubic feet, to be detectable by Schönbein's test in every part, and this even when there is good ventilation. The objection to the production of ozone, that there is not a sufficient bulk of water to absorb the fumes of phosphoric acid, may be obviated by using a vessel containing a larger quantity of water, and by floating the phosphorus at the proper depth upon its surface. The degree of evolution of ozone may be tested by a slip of Schönbein's paper. It is very remarkable that, during the prevalence of cholera in any district, ozone has been observed to be absent in that district; not the smallest trace has been discoverable by the test-papers."

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Infanticide in England.—Mr. Simon said, in his evidence before the Committee on the Chemists' and Druggists' Bills: "There are some country districts of England where child killing by opium is monstrous. Every one knows that in some of the manufacturing districts, where mothers are employed and children are neglected, the mortality of infants is twice or thrice what one would call the nominal rate of dying, and that a considerable share of this undue mortality is caused by dosing with preparations of opium. But it is not equally well known that in certain country districts the same amount of mortality of infants is to be observed; and when the particulars of this are inquired into, it appears that the conditions are very similar to those which operate in the manufacturing districts, and that even a greater proportion of the mortality is caused by the domestic administration of opium. I should not like you," Mr. Simon continued, "to suppose that I think much of it is intentional. I do not think that, but there is a carelessness as to the result that is hideous. On this subject the committee would find the facts given in my last annual report, and especially with reference to the marsh districts of England. The women work in gangs, and travel about the country, leading often a very reckless and rollicking life, and leaving their children a great deal to chance as they travel about. The children fare very badly, as the children do in manufacturing towns. To be kept quiet they are drugged with opium. The peasantry have a tradition that opium is useful in their ague, and have got so familiar with it that many of the adults are opium eaters. Having this local knowledge of opium, they use it to children very largely, the children dying monstrously. The mothers—namely, the agricultural gangwomen—appear often to be very reckless whether the children live or die. The children are an encumbrance to them."—*Brit. Med. Jour.*, Aug. 5, 1865.

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Illegitimate Children in England.—It appears from the Registrar-General's Report that more than 47,000 children were born out of wedlock in 1863, which is rather more than during the two preceding years. The proportion varied much in different parts of the kingdom. In London it was very low, but in all great towns some of these births escape registration. South of the latitude of London the proportion was generally below the average, but not often in other parts. In Bedfordshire 7.1 per cent. of the children were illegitimate, in Hertfordshire and Oxfordshire 7.3, in Suffolk 7.9, in Norfolk 11 3 per cent. In all the north-midland counties—Notts, Derbyshire, etc.—the proportion was high; in Shropshire it was 10.1 per cent. In North Wales it was 8.6, in the North Riding 9.2, in Westmoreland 9 2, and in Cumberland no less than 12 per cent. The Registrar-General considers it surprising that so little attention is paid to the disclosure that year after year a rate of illegitimacy far above the average prevails in certain counties.

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Cholera at Marseilles.—From the first eruption of cholera at Marseilles up to the 15th of September last, a period of two months, 1,067 persons had fallen victims to the disease.

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Cholera in England.—Cholera has made its appearance in England. At Bitterne, near the Royal Military Asylum at Netley, and about three miles from Southampton, up to Oct. 4th there had been five deaths, and six cases were under treatment. At Southampton, up to the same date, there had been two deaths, and six cases were under treatment.

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Cholera in Spain.—Cholera is making fearful ravages in Spain. At Madrid, on the 13th of Oct., five hundred and forty cases, and one hundred and seventy-five deaths occurred.

Ophthalmia in the Belgian Army.—In the Belgian army of 50,000 men 100,000 cases of Ophthalmia occurred in the 25 years between 1814 and 1839.

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Effects of Electricity on the Body.—M. BOUDIN gives two instances in which the corpses of persons killed by lightning seemed to be charged with electricity like Leyden jars, for in each instance persons going to the assistance of the deceased received violent shocks.

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Typhoid Fever in Pigs.—Dr. W. BUDD states that typhoid fever has destroyed 10,000 to 15,000 pigs in the southwest of England during the last eighteen months.

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Cattle Plague among Sheep.—The ravages of cattle plague, up to our latest advices, were unabated in England; indeed the area of its prevalence is still increasing. A new fact of serious import has lately been made known on the authority of the Professor of the Royal Veterinary College, which is that sheep as well as oxen may become victims of the disease.

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Preservation of the Remains of Extinct Species.—Prof. HUXLEY observes: "Almost all the hard parts of animals—the bones and so on—are composed chiefly of phosphate of lime and carbonate of lime. Some years ago, I had to make an inquiry into the nature of some very curious fossils sent me from the north of Scotland. Fossils are usually hard, bony structures that have become imbedded in the way I have described, and have gradually acquired the nature and solidity of the body with which they are associated; but in this case I had a series of *holes* in some pieces of rock, and nothing else. Those holes, however, had a certain definite shape about them, and when I got a skilful workman to make castings of the interior of these holes, I found that they were the impressions of the joints of a back bone and of the armour of a great reptile, twelve or more feet long. This great beast had died and got buried in the sand; the sand had gradually hardened over the bones, but remained porous. Water had trickled through it, and that water being probably charged with a superfluity of carbonic acid, had dissolved all the phosphate and carbonate of lime, and the bones themselves had thus decayed and entirely disappeared; but as the sandstone happened to have consolidated by that time, the precise shape of the bones was retained. If that sandstone had remained soft a little longer, we should have known nothing whatsoever of the existence of the reptile whose bones it had encased. How certain it is that a vast number of animals which have existed at one period on this earth have entirely perished, and left no trace whatever of their forms, may be proved to you by other considerations. There are large tracts of sandstone in various parts of the world, in which nobody has yet found anything but footsteps. Not a bone of any description, but an enormous number of traces of footsteps. There is no question about them. There is a whole valley in Connecticut covered with these footsteps, and not a single fragment of the animals which made them has yet been found. Let me mention another case, while upon that matter, which is even more surprising than those to which I have yet referred. There is a limestone formation near Oxford, at a place called Stonesfield, which has yielded the remains of certain very interesting mammalian animals, and up to this time, if I recollect rightly, there have been found seven specimens of its lower jaws, and not a bit of anything else, neither limb-bones nor skull, or any part whatever; not a fragment of the whole system! Of course it would be preposterous to imagine that the beasts had nothing else but a lower jaw! The probability is, as Dr. Buckland showed, as the result of his observations on dead dogs in the River Thames, that the lower jaw, not being secured by very firm ligaments to the bones of the head, and being a weighty affair, would easily be knocked off, or might drop away from the body as it floated in water in a state of decomposition. The jaw would thus be deposited immediately, while the rest of the body would float and drift away altogether, ultimately reaching the sea, and perhaps becoming destroyed. The jaw becomes covered up and preserved in the river silt, and thus it comes that we have such a curious circumstance as that of the lower jaws in the Stonefield slates. So that, you see, faulty as these layers of stone in the earth's crust are, defective as they necessarily are as a record, the account of contemporaneous vital phenomena presented by them is, by the necessity of the case, infinitely more defective and fragmentary."

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